

 (Currently Amended) A method of removing photoresist from a substrate, comprising: sequentially-treating the photoresist with a first reactant to cause swelling, cracking or delamination of the photoresist; and

subsequently treating the photoresist with a second reactant to chemically alter the photoresist; and

subsequently removing the chemically altered photoresist with a third reactant.

- 2. (Original) The method of claim 1, wherein the photoresist is formed by ion implantation.
- 3. (Original) The method of claim 2, wherein the ion implantation was performed at a dose of  $3 \times 10^{15}$  ions/cm<sup>2</sup> or higher.
- 4. (Original) The method of claim 1, wherein the first reactant is supercritical carbon dioxide (SCCO<sub>2</sub>).
- 5. (Original) The method of claim 4, wherein the supercritical carbon dioxide (SCCO<sub>2</sub>) is at a temperature of 100-150°C and a pressure of 150-200 bar.
- 6. (Original) The method of claim 1, wherein the second reactant is an ozone-based reactant.
- 7. (Original) The method of claim 6, wherein the ozone-based reactant is ozone vapor.

- 8. (Original) The method of claim 6, wherein the ozone-based reactant is ozone gas mixed with water vapor.
- 9. (Original) The method of claim 7, wherein the ozone vapor is at a temperature of 105-115°C and a pressure of 60-80 kPa.
- 10. (Original) The method of claim 7, wherein the ozone vapor is at a concentration of 90,000 ppm or greater.
- 11. (Original) The method of claim 1, wherein the chemically altered photoresist is removed by rinsing.
- 12. (Original) The method of claim 1, wherein the third reactant is deionized water.
- 13. (Original) The method of claim 1, wherein the photoresist is normal photoresist.
- 14. (Original) The method of claim 1, wherein the photoresist is a photoresist damaged by etching.
- 15. (Original) The method of claim 1, wherein the photoresist includes at least one of organic residue and organic contaminants.

- 16. (Currently Amended) A method of removing photoresist, from a substrate, comprising: sequentially-treating the photoresist with supercritical carbon dioxide (SCCO<sub>2</sub>; and subsequently treating the photoresist with an ozone-based reactant; and subsequently removing the photoresist with deionized water.
- 17. (Original) The method of claim 16, wherein the supercritical carbon dioxide (SCCO<sub>2</sub>) is at a temperature of 100-150°C and a pressure of 150-200 bar.
- 18. (Original) The method of claim 16, wherein the ozone-based reactant is ozone vapor at a temperature of 105-115°C and a pressure of 60-80 kPa.
- 19. (Previously Presented) A method of removing photoresist from a substrate, comprising: loading the substrate into a chamber;

injecting a first reactant into the chamber and converting the first reactant to supercritical condition;

maintaining contact between the substrate and the supercritical first reactant;

depressurizing the chamber;

injecting a second reactant into the chamber;

maintaining contact between the substrate and the second reactant;

purging the chamber and unloading the substrate;

removing the photoresist; and

drying the substrate;

wherein injecting the first reactant and injecting the second reactant are performed sequentially.

20. (Original) The method of claim 19, further comprising:

before injecting the second reactant, loading the substrate into a second chamber, wherein said maintaining and purging occur in the second chamber.

- 21. (Original) The method of claim 19, wherein the first reactant is supercritical carbon dioxide (SCCO<sub>2</sub>).
- 22. (Original) The method of claim 21, wherein the supercritical carbon dioxide (SCCO<sub>2</sub>) is at a temperature of 100-150°C and a pressure of 150-200 bar.
- 23. (Original) The method of claim 19, wherein the second reactant is an ozone-based reactant.
- 24. (Original) The method of claim 23, wherein the ozone-based reactant is ozone vapor.
- 25. (Original) The method of claim 23, wherein there is a 10-15° difference between the second chamber and the ozone-based reactant.
- 26. (Original) The method of claim 25, wherein the second chamber is at a temperature of 105°C and the ozone-based reactant is at a temperature of 115°C and a pressure of 60-80 kPa.

- 27. (Original) The method of claim 23, wherein the ozone-based reactant is at a concentration of 90,000 ppm.
- 28. (Original) The method of claim 19, wherein the rinse is a deionized water rinse.
- 29. (Original) The method of claim 21, wherein the supercritical carbon dioxide (SCCO<sub>2</sub>) causes swelling, cracking or delamination of the photoresist.
- 30. (Original) The method of claim 24, wherein the ozone vapor alters the photoresist into a water soluble product.

Claims 31-50 (Cancelled).

- 51. (Previously Presented) The method of claim 1, wherein the photoresist is treated with the first reactant, then treated with the second reactant.
- 52. (Previously Presented) The method of claim 51, wherein the first reactant is supercritical carbon dioxide (SCCO<sub>2</sub>) and the second reactant is an ozone-based reactant.
- 53. (Previously Presented) The method of claim 52, wherein the photoresist is treated with the second reactant and then is removed with the third reactant.

- 54. (Previously Presented) The method of claim 53, wherein the third reactant is deionized water.
- 55. (Previously Presented) The method of claim 16, wherein the photoresist is treated with the supercritical carbon dioxide (SCCO<sub>2</sub>), then treated with the ozone-based reactant.
- 56. (Previously Presented) The method of claim 55, wherein the photoresist is treated with the ozone-based reactant and then is removed with the deionized water.
- 57. (Previously Presented) The method of claim 19, wherein the photoresist is treated with the first reactant, then treated with the second reactant.
- 58. (Previously Presented) The method of claim 57, wherein the first reactant is supercritical carbon dioxide (SCCO<sub>2</sub>) and the second reactant is an ozone-based reactant.
- 59. (Previously Presented) The method of claim 58, wherein the photoresist is treated with the second reactant and then is removed with the third reactant.
- 60. (Previously Presented) The method of claim 59, wherein the third reactant is deionized water.